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ORIGINAL ARTICLES.

THE HORSE'S FOOT.

By A. Zundel.

(*Continued from page* 54.)

C. Sub-horny Quittor.—This is the inflammation of the superior part of the keratogenous apparatus, of the cutidura; or even of the superior parts of the sensitive laminæ. This quittor is, therefore, located under the horny box, and is more like the cartilaginous kind, which old hippiatrics, and especially Sollysel and Garsault, describe with it. It generally takes place on the quarter, and more seldom at the toe, or at the mammæ. Sometimes it is observed at the heels, but it is then of small consequence.

I.—*Symptoms.*—The lameness is very great. The animal walks on three legs, and there is strong reactive fever, due to the excessive pain,—this form of the disease being more painful than the others, in consequence of the pressure of the horny structure upon the inflamed tissues. At the origin of the nail a warm and very painful tumor is found; the foot is hot and the hairs staring on the site of the injury. If the disease has existed for some time, there is a separation of the hoof at its origin, due to a seropurulent exudation, and under the hoof suppuration and mortification of a more or less extensive portion of the coronary band, or

of the laminæ will be found. The suppuration which there exudes varies, being in rare instances blackish, as it is usually found in traumatic injuries of the hoof; or, again, it is white and unctuous, with the odor of decaying cheese; while more commonly it consists of a bloody or greyish matter, mixed with pus.

If the mortified portion is not deeply seated, so that the slough can take place readily, the quittor is quite simple, since as soon as it has dropped off there is a well marked improvement. The pain then ceases almost instantaneously, and the wound at once progresses towards cicatrization. But it is not rare, even when the mortification is somewhat superficial, to find the sub-ungueal suppuration extending so that the matter runs under the hoof, producing at times a more or less serious fistula, or a separation of the sensitive and insensitive laminæ. Girard says it has been seen to extend down to the sole, and to separate it from the velvety tissue. The deep sub-horny quittor may be complicated, forward, with necrosis of the tendon of the extensor muscle; with the inflammation of the joint with caries of the os pedis, and even to assume the cartilaginous form of the disease by its extension to the cartilages of the foot.

After the recovery of the sub-horny quittor, if the coronary band has been mortified in its entire depth, the foot may present permanent longitudinal fissures, or seams, or transversal grooves, presenting evidences of the existence of a cicatrical tissue when the quittor was in progress.

II.—*Prognosis.*—The gravity of this quittor depends upon the depth of the disease. When superficial and affecting only the surface of the tissue, it is easy to cure, but if deeply seated it is more serious, on account of the possibility of complications.

III.—*Etiology.*—Bruises and violent blows are the ordinary causes of sub-horny quittor. It is commonly due to overreaching, or to the wounds occurring when animals are wearing long caulks, as in winter. The irritating effects of frozen mud has also been admitted as a cause.

IV.—*Treatment.*—The superficial quittor requires a simple treatment. Emollient baths and maturating poultices are then indicated. It is a good plan to thin the wall with the rasp or

the sage knife over the whole extent of the furuncular tumor to a height of about two fingers. Compresses of chloroformed oil, while it alleviates the pain, are also indicated to soften the wall. It frequently becomes necessary to puncture the tumor, but we prefer to cauterize it with a pointed iron, following the cauterization with a poultice of honey with Venice turpentine or camphor. Some authors recommend astringent baths, as oak bark, or of sulphate of iron. It is often the case that after some interval following sloughing of the *bourbillon*, the wound continues to discharge a liquid secretion, which is an evidence that there is a tendency to accumulation of matter towards the lateral cartilage, or under the wall, in the laminæ; or that there is some carious spot existing. In the first, if probing horizontally, a cavity is detected, it is convincing evidence that a cartilaginous quittor is in course of development; in the second case, the pressure and collection of the matter increases the inflammation of the laminæ, separates the wall, and complicates the disease, necessitating the *operation of the sub-horny quittor.*

The removal of the portion of the hoof which covers the lesion, must, however, include more than the purulent center, so that the diseased tissues may be well exposed and the suppurative process detach them readily. This removal, always proportioned to the internal lesions, is made either lengthwise, following the direction of the horny fibres, or crosswise. In that case, it will attack only a portion of the wall towards its point of union with the skin. This latter method, it is true, requires less cutting, but it has several quite serious objections and often necessitates a second operation. Even in cases where the growth of the granulations can be controlled, and where a good return of the horse is obtained, the hoof only recuperates its perfect integrity by the slow growth downwards of the wall. In some circumstances the operation is completed by the removal of a portion, or even of the entire mass of the sole, when it is separated from the velvety tissue.

The removal of a portion of the wall must be accomplished in the manner which will be indicated for cartilaginous quittor, in carefully avoiding the injury of the coronary band and of

the podophyllous tissue. The diseased tissue being exposed, all that is of bad appearance is removed, the carious portion being freely taken off. An ordinary dressing of oakum with diluted alcohol, or any other drug, kept in place with a light shoe or slipper, entire or truncated, as the case requires, is then applied.

As for all wounds of the foot, the dressing needs only to be changed when the pus accumulated under the oakum or other peculiar conditions indicate it. It is true that changing the dressing is an effective means of cleansing the wound, but it has also the inconvenience of also irritating it, and especially at the beginning may tend to interrupt the natural process of repair. It is of advantage, after the first dressings, to change them as infrequently as possible. In this way hemorrhages, which may always be looked for, are avoided. This is a point of the first importance. It has been proved that even in operations where a portion of the wall has been removed, a dressing left on for from fifteen to twenty days without removal, was followed by rapid recovery, the new hoof growing under the oakum without suppuration. It is useless to probe or wipe out the surface of the wound. On the second dressing, that is, after a few days, the parts begin to be covered with numerous white points, which are so many rudiments of hoof. These, which at first are soft, white and isolated, gather together by degrees, at first unite into a thin layer, soft and yellowish. This becomes hard and thick; it is the hoof secreted by the laminæ, which, little by little, unites with that coming from the coronary band. Excessive granulations or proud flesh are removed in the ordinary way.

D.—Cartilaginous Quittor.—*Hufknorpelfister*, (German)—(*improperly called sub-horny quittor* by Lafosse, Jr.; *coronary* quittor of Vitet; *fibro-chondritis* of the third phalanx, by Vatel; sub-horny cartilaginous quittor of Girard; quittor proper of Delwart). This form of quittor is peculiar to solipeds, they being the only animals which have fibro-cartilage on the os pedis.

These fibro-cartilages are two pieces, which, with the plantar cushion, complete the os pedis and form the base of the heels, each representing a piece flattened sideway, parallelogram in shape, and extending posteriorly to the coffin bone. Their external

face is convex and pierced with foramina for the passage of veins and slightly overlays the surface of the bone of the foot. It is separated from the skin by a very rich vascular plexus. The internal face, concave, is hollowed by vascular grooves and covers, forward the articulation of the foot and the cul de sac of the synovial sac which protrudes between the two lateral ligaments of that joint. Downwards and backwards it is united to the plantar cushion, either by continuity of tissue, as near the inferior border, or by fibrous bands running from one to the other. The superior border, either convex or straight, is thin, and separated from the posterior by an obtuse angle in front of which it presents a deep notch for the passage of the blood vessels and nerves. The inferior border is attached, forward, to the basilar and retrosal processes of the os pedis. Behind this it reflects inwards, to continue to the inferior face of the plantar cushions. The posterior border, oblique, backwards and downwards, is slightly convex and unites with the preceding. The anterior border, oblique in the same direction, is more intimately united to the anterior lateral ligament of the articulation and can be separated from it only by artificial dissection. It sends upon this ligament and upon the anterior extensor of the phalanx, a fibrous extension, which unites with that of the opposite side.

In their structure the fibro-cartilages comprehend a mixture of fibrous and cartilaginous tissue, a mixture which is far from being homogenous and even in the various parts. The more it is examined forwards and near the base, the more its substance is seen to resemble that of cartilages proper, being white, flexible, brittle, and homogenous. Towards its posterior part it loses its characters of homogenity, becomes less brittle and presents in its thickness a greater amount of fibrous texture. More posteriorly again, the fibro-cartilaginous structure is more marked. By close attention it seems to show cartilaginous nuclei, isolated, and surrounded with an entirely fibrous substance; and again, at its posterior extremity it becomes fibro-greasy with much cellular tissue and unites with the plantar cushion. The vitality of the cartilage is in inverse ratio with its density and consequently is greater in its posterior part than towards the base and its anterior

extremity. This fibro-cartilage may easily and more or less completely become ossified; old horses are those which most commonly present this condition, and draught horses are more subject to it than those used to the saddle. It may assume various forms. At times it occupies the entire extent of the cartilage, and others only at its base; sometimes the external surface is ossified, while the internal remains in its normal structure; then again the ossification exists only anteriorly while the posterior is cartilaginous, and it more rarely happens that the process consists in bony lamellæ, which, starting from the base, spread towards various points of its circumference.

These fibro-cartilages are generally more developed in the anterior than the posterior extremities. They also present, in one foot, this slight difference, that the internal stands a little higher than the external.

Cartilaginous quittor is a serious affection characterized by the partial caries of one of the fibro-cartilages; it is a partial gangrene whose character is to slowly spread into the cartilaginous structure upon which it starts. To be treated with success it requires a very regular attendance, and often an operation, which consists in the removal of the cartilage. Sometimes this operation is indispensable, and its study is interesting, especially because, though not as commonly performed as at the beginning of this century, it is one which requires a high degree of surgical skill for its success.

(*To be continued.*)

ON THE PRODUCTION OF IMMUNITY FROM CONTAGIOUS FEVERS BY INOCULATION WITH DILUTED VIRUS.

By D. E. Salmon, D.V.M.

(*Continued from page 70.*)

Interesting and important as the results I have detailed evidently are to the veterinarian and the agriculturist, they would be more or less out of place in this journal, were it not for the probability that the germs of the contagious fevers in men and

animals are very closely related organisms, that the mysterious condition of the animal body, which we call insusceptibility, is comparable from all points with the insusceptibility of mankind, and that the methods by which we can grant immunity to animals are equally applicable to the human subject. From this standpoint it at once becomes a matter of importance to learn if the diluted virus of other contagious fevers of animals produces either a milder affection or a harmless local irritation also ending in immunity; in other words, is our method of vaccination, with a small number of very virulent germs, generally applicable to the various diseases of this class?

In April, 1881, M. Chauveau* announced the result of experiments made with charbon virus, by diluting virulent blood until each cubic centimeter contained from fifty to one thousand rods of the *bacillus anthracis*, and injecting this dose directly within the jugular vein. He did not state how the number of germs was estimated, and one would suppose that this would be rather a difficult matter to accomplish with any degree of certainty, unless, indeed, an apparatus similar to that used for counting blood corpuscles was at hand. M. Chauveau believed that by introducing the germs directly into the blood-stream there would be less danger of a fatal result—a supposition which may be contested from the results of my experiments. In his first experiment four sheep received a dose of one thousand bacilli each. All died of charbon. In the second experiment, two sheep received about six hundred bacilli each. One died of charbon; the other did not shew the least symptom of disease. In the third experiment, one animal received fifty and the other one hundred bacilli. To the liquid containing the larger number one per cent. of carbolic acid was added. No effect was produced by the carbolized virus; the other animal had a very slight fever of short duration.

The animals remaining from the second and third experiments, and two others, in all five sheep, received, seven days after the third experiment, a dose containing about one thousand bacilli. All died of charbon; but the one which had showed slight.

* Comptes Rendus, xcii., 1881, p. 844.

symptoms of fever in the third experiment did not die until the seventh day. The death of this animal was due to a bacterial meningo-encephalitis—being the usual result of inoculating partially insusceptible sheep with large quantities of virus. It seemed, then, that this one animal had acquired a certain degree of immunity.

In the fifth experiment, five sheep received about two hundred and fifty bacilli each. All recovered after presenting slight and transient symptoms of fever. Reinoculated, six weeks later, with strong virus, four resisted perfectly, while a single one died. In this experiment, the first virus used was taken from a rabbit which had been dead several days, though perfectly preserved because of the cold weather. We know, however, from Pasteur's experiments, that when the bacilli are preserved, either at so high or so low a temperature that they cannot form spores, they rapidly lose their virulence, and, as in this case the strength of the undiluted virus was not tested, there is some reason to doubt if the dilution should receive the entire credit of the results.

In the same communication, M. Chauveau records an observation with the virus of *charbon symptomatique*, which corresponds to the black quarter of this country, and is entirely distinct from charbon. This virus, though one of the most active known, may be injected into the veins in considerable quantity without causing death ; but a very much smaller dose in the connective tissue infallibly destroys cattle and sheep. In December, 1880, ten sheep had been collected, which, from many preventive inoculations with charbon virus, had obtained a very complete degree of immunity from this disease. Before receiving their final test, they were to have a last preventive inoculation with one cubic centimeter of liquid extremely rich in bacilli. By mistake this liquid was filtered through a cloth that had served in preparing the virus of *charbon symptomatique*. This cloth had been washed, but a sufficient quantity of virus remained in it to produce the disease in each of the ten sheep. The virulent liquid was drawn with a syringe from a high and narrow vessel, so that for each animal it came from a different depth. The result was in proportion to this depth, being mildest with the first and most severe

with the last. The first four recovered, while the remaining six died. A month later, an inoculation was made in the other thigh of those which had recovered, with a considerable quantity of black quarter virus. The resulting symptoms were very mild, but not equal with all. Those which suffered the least by the former inoculation were more intensely affected by the latter.

The observations of M. Chauveau are undoubtedly very important if we look upon them as confirming the doctrine of attenuation by dilution, but of themselves they are plainly insufficient to establish this doctrine with either of the diseases with which they are connected. With charbon all the indications must be drawn from the last experiment, and this was made with virus of doubtful activity. The observation with black quarter virus was not a premeditated experiment, there was no intention to inoculate with this virus, and, consequently, it cannot carry the weight of a genuine experiment. At the same time, viewed in the light of my results with fowl cholera, these experiments with charbon and the observation with black quarter are sufficient to show that these viruses are subject to the general law which my experiments were first to demonstrate.

Still more recently, M. Peuch,* Professor at the Toulouse Veterinary School, has made experiments in the same direction with the disease known as sheep-pox. This is a form of variola peculiar to sheep and extremely fatal to these animals. It has been combatted in the north of France by inoculation, but in the southern departments the losses from this operation were so nearly equal to those caused by the spontaneous disease that the practice has been about abandoned. As the danger in this disease is principally due to the eruption, and as M. Chauveau in his experiments with vaccine had granted immunity to cattle by hypodermic injection of virus without producing any specific eruption, M. Peuch conceived the idea that by reducing the number of germs by dilution, and injecting the liquid beneath the skin, a similar result might be obtained with sheep-pox. His recorded experiments have been made with seventeen sheep. Eight were inoculated

* Recueil de Médecine Vétérinaire, 1882, p. 977.

with a dilution of 1 to 20, four with a dilution of 1 to 30, and five with a dilution of 1 to 50. The inoculations with the strongest virus (1 to 20) produced a general eruption, which followed the regular course. But with the weakest virus, injected in half the quantity, the effect was less marked. With five sheep inoculated with eight centigrammes of this dilution, a single one presented a very mild secondary eruption, three had a pustule at the point of inoculation, the fifth had only a slight swelling at this point. All acquired immunity.

These experiments, like Chauveau's, are not sufficiently numerous to demonstrate a great principle, but they are one more and a very important contribution to this end. In the methods of both of these gentlemen, there is much to be desired before they could be applied in practice, especially to such virulent diseases as fowl cholera, with which a single drop of a dilution of 1 to 40,000 sometimes causes death. The strong virus which they use varies greatly in strength, it contains coagula and animal *debris* which prevents its even diffusion; it is in many cases difficult to obtain when desired. By my method the virus is obtained of a definite strength; it may be preserved for an indefinite length of time in cultivation tubes, and in a short time can be increased to any desired quantity. These are points which, especially in endeavors to control the diseases of mankind, must be considered of the greatest importance.

In presenting a new method for attenuating the active viruses of contagious diseases it is, of course, desirable to know how it compares practically with the method of M. Pasteur which has recently received so much attention, and which, in spite of adverse criticism, must be accepted as a remarkable advance in medical science. It has not been unusual for men who stand quite high in scientific circles to speak of Pasteur's method as though the mitigation in this case was produced by dilution; others of equal eminence have told us that it consisted in passing the virus through a large number of cultivations. In reality, it is neither the one nor the other. Pasteur's first attenuation was made with fowl cholera virus, and his method with the later ones has only been changed to suit the peculiarities of the virus of

other diseases. With fowl cholera a cultivation of the virus was made in sterilized broth, the flask being arranged to admit filtered air. This was set aside for an indefinite period, varying from five to eight months, during which time the attenuation occurred. A second cultivation, made from this first one after this indefinite period, was the vaccinal virus. During this time the activity of the germs is gradually lessened, but the same degree of attenuation does not always occur in the same length of time; and when preparing fresh vaccine the degree of attenuation must be determined by inoculation experiments.

When the vaccine is once obtained it may be preserved for a considerable time by frequently renewing the cultivations of it, but this cannot be done indefinitely, as Pasteur at first announced. This vaccine gradually loses its strength, no matter what precautions are observed; consequently it must from time to time be renewed, the setting aside for from five to eight months, and the testing of the activity, which involves much trouble and expense, to say nothing of the skill required, all must be gone over again as at first. What makes this still worse, there must be two vaccines, one stronger than the other, because the weaker vaccine is too inactive to grant complete immunity.

With charbon virus, the attenuation occurs more rapidly, being complete in less than eight days for the weaker vaccine; but here there is also an obstacle to its preparation. The virus must be kept at a constant temperature of 42° to 43° C. to prevent the formation of spores. If spores are formed there is no attenuation, and the vaccine obtained will produce fatal effects. Koch and Klein have each attempted to show that virus could not be attenuated in this way; but they undoubtedly failed by allowing spores to form either by variation of the temperature, by the liquids being too shallow, or from neglecting to supply some other required conditions. These experiments, while they cannot overthrow Pasteur's general conclusions, are sufficient to demonstrate the difficulties and the uncertainties of the method when attempted by others less skilful than the originator.

With this method of attenuation by dilution, as I have developed it, most of these difficulties are avoided. The prepara-

tion of the standard virus and its dilution can be accomplished, with fowl cholera at least, within twenty-four hours from the time the particle of blood which originates it is taken from the affected animal. The stronger the virus the longer will it retain its full activity, and, hence, the unmitigated virus is in far the best condition for preservation, and the dilution can at any time be made in a few minutes.

Again, the method of Pasteur cannot well be applied to human diseases, because it requires too many experiments to learn the degree of attenuation. In some cases the attenuation does not occur until a few hours before the death of the virus, while in other cases it may be weeks or months before. So that, in applying it to a new disease, there are no indications except those furnished by inoculation experiments. On the other hand, if we dilute we know that we attenuate. If we introduce but ten or twenty germs of almost any disease the probabilities are that the effect would be very slight; if such an inoculation were unsuccessful the number could be gradually increased. Surely when many people are exposed to a deadly plague, it would not be impossible to pursue this class of investigations. Of course, I only mean the above remarks to apply to those non-recurrent fevers from which immunity may be acquired within a few days or weeks.

Whether I am right or wrong in considering that this method of preventive inoculation may, under certain circumstances, be used advantageously in controlling the plagues of mankind, it seems to me that the method by dilution has some incontestable advantages over the method of Pasteur. I may summarize these as follows: 1. The virus is obtained by a definite strength. 2. It may be preserved in the condition in which it retains its activity the longest time. 3. The attenuation requires but minutes instead of weeks or months. 4. The experiments to learn the proper degree of attenuation are less dangerous to the individuals operated upon. 5. These experiments once made, it is not necessary to repeat them with every fresh lot of virus. 6. One virus and one successful vaccination are all that is required. 7. The

amount of virus needed is many times less than with other methods. Certain disadvantages will doubtless be revealed by the experiments of the future, but their importance cannot be foretold.

I should not be surprised if greater advances are made by the investigations of the future, for the prevention of contagious diseases, than have been accomplished in the past; possibly vaccination in all forms may be discarded, but at present the question is fairly before the medical profession—Shall we vaccinate with a large number of comparatively inactive germs, or with a small number of those which retain their greatest virulence?

The solution of such a question can hardly be made from theoretical considerations; it may even require investigations which include a large number of individuals, scattered over a considerable territory and embracing a variety of diseases; but, with the principles upon which these methods depend for their success once understood by our scientists, it cannot be long before we have the elements for a complete and satisfactory conclusion. At the same time it is not to be forgotten that the method by dilution, because of the little time required to prepare the virus, might often be resorted to when the other would be impossible.

In conclusion, I would call attention to the following points of this communication, which are believed to be original:

First.—The method of producing a virus of standard strength.

Second.—The fact that germs which usually multiply throughout the whole body may be compelled to limit their reproduction to the point of inoculation by reducing the number inserted.

Third.—That this local multiplication grants an immunity from the disease in the future.

Fourth.—That a very small number of germs may be introduced into the tissues with impunity, and are not able to produce the least effect, either general or local.

TEXAS FEVER.

NOTES OF AN OUTBREAK OF THAT DISEASE AMONG CATTLE.

By M. R. Trumbower, V.S.

September 24th, 1882.—I was requested by Mr. Gleason, of the firm of Martin & Gleason, dealers in cattle, to go with him to examine several animals belonging to them which had been found dead in the field.

The first one examined was a two-year-old steer; found him lying on his right side; had probably been dead six hours; ground indicated no ante-mortem struggles; fæces passed, thin, green, and well digested; no evidence of bloating, nor of decomposition. Removed the left shoulder, cut through the ribs at their superior articulations, and removed entire the wall of the chest and abdomen, exposing the internal organs to view. The lungs were found healthy, with the exception of a slight emphysematous condition and trifling hypostatic congestion of the posterior lobe of right side; pericardium of a normal appearance contained about an ounce of bloody colored serum; heart pale, flabby, and of normal size; externally the apex, right side, and both auricles presented slight ecchymosis; the left ventricle contained a small quantity of thin watery appearing blood, but no clot; the columna carnea were studded over with ecchymosis of a bright purplish tint; the right ventricle contained a small blood clot; the valves, chords, and columns were healthy. Examining the abdominal organs, the spleen attracted immediate attention, of a dark purple color, enlarged to three times the normal size; incising it the trabiculæ were found broken down, and general disorganization had taken place. Liver somewhat enlarged, the upper portion of right lobe of a straw color; gall bladder contained about six ounces of semi-fluid, viscid, almost brown colored bile.

First three stomachs indicated no functional or organic disturbance; fourth stomach, lining membrane reddened and having an irritated appearance; the color presented a few ecchymosed spots on its external surface; the internal surface of

jejunum slightly conjested and thickened; the mucous membranes of cæcum and rectum also manifested some congestion. Kidneys somewhat enlarged and of a dark color in their circumference, otherwise apparently normal in structure; urinary bladder perfectly healthy in appearance, and contained about four pints of very dark colored urine; specific gravity of urine 1008, slightly alkaline, and formed a large coagulum upon boiling. The appearance of the muscular tissue of the animal was very pale and bloodless; the small amount of blood contained in the arteries and veins was of the same color, very thin and watery, and from a total absence of clots was apparently almost destitute of fibrine.

Post-mortem examination of steer No. 2. Aged two years, died apparently without a struggle, still quite warm. Proceeded as in No. 1, and found the appearances throughout about the same except a considerable congestion and apparent sub-acute inflammation of the intestines; the longitudinal folds of the rectum presented black streaks caused by an extravasation of blood under the mucous membrane; contents thin, and mixed with blood and mucus. Mesenteric glands greatly enlarged, some of them measuring fully three inches in length, two wide, and half an inch in thickness, of a vealy color, and possessed a soft, doughy feel to the touch.

These two animals examined were in but fair condition, and had the appearance as if rapidly fallen off in flesh, gaunt, and the skin drawn tight over the ribs.

Two more steers belonging to the same parties were reported as lying dead on the other side of the creek; but it was getting late in the day, so they were not examined; they had died some time during the previous night; the two examined were alive in the morning, one of them down, unable to rise, and the other one staggering in his gait and purging; this was the first intimation had of any sickness among the herd of Martin & Gleason's cattle, and the first ones that died in their field during the season. Upon leaving the field I noticed two animals showing evidences of sickness, manifest by weakness—a general loose-jointedness in their gait, saliva dribbling from the mouth, eyes dull and star-

ing, and a diarrhœa. After considerable chasing we succeeded in catching one of them; age, two years: pulse, 90; respiration, 32; legs, horns and body warm; administered one dram of sulphuric acid in water. Next day Mr. Gleason reported this one apparently improving and the other one warm; but on the morning of the 26th both were found dead, together with a third one, which had not been previously noticed. No opportunity was given for examination.

Martin & Gleason suffered a total loss of seven head out of a herd of 130 then in the pasture.

Six of the number that died had been placed upon this field on the 8th day of September, and the seventh one had been in since early in June.

The field in which these cattle died is situated four miles north of Sterling, Whiteside County, State of Illinois, and on the west side of a public road running north and south; the field contains 160 acres of part timber and part bottom land; through it runs a good-sized stream of water named Elkhorn creek; into this field were placed about 100 head of Cherokee or Indian cattle, on or about the 5th day of June last, together with about 50 head of native cattle; and the 23d day of July another lot of Cherokee and native cattle, numbering 50 head, were added; both lots were purchased in Chicago, where they had just been received from St. Louis. Throughout the season, or from June 1st to September 25th, about 500 head of cattle or upwards, including the two lots mentioned, had been pastured on this field, and from thence went by small lots to the butchers at the rate of 100 a month. On the 25th of September about 120 head, the number then remaining in the field, were sold and shipped to Chicago.

On the 1st day of July a heavy freshet occurred, which swept away the fence intervening between the field of Martin & Gleason's on the west, and that of Mr. William Echtinach's on the west; the fences along the road were also carried away, and the cattle of Martin & Gleason's crossed the road into the pasture field of David Wolf, through it into John Stouffer's, thence into Ben Bressler's timber; in Mr. Wolf's field some of the Cherokee

cattle remained for several days, and one until the 6th of October.

The field belonging to Mr. Echtinach traversed by the cattle of Martin and Gleason's was partly planted with corn and part sowed in oats. Mr. Echtinach's cattle did not come into contact with Martin & Gleason's cattle after the 2d day of July, neither did Martin & Gleason's cattle penetrate Mr. Echtinach's regular pasture-field, which adjoins the corn-field on the west. The Elkhorn creek runs through all these fields enumerated, its course being from east to west.

October 8th.—Mr. Thares Landis, living two miles north of Sterling, informed me that he lost a steer on the night previous.

I proceeded to his place, accompanied by Messrs. D. N. Foster and Henry Bressler, the latter gentleman informing me that he, also, lost a fat steer this morning.

History given by Mr. Landis: Removed from David Wolf's pasture-field twelve head of cattle on the 5th, where they had been since the 1st of May; on the 6th, one of the animals brought home was noticed to be ailing, and on the morning of the 8th was found dead.

Post-mortem appearance, No. 3. Aged 30 months; fat and in excellent condition; lying on his left side outstretched; drops of blood standing all over the body. Turned him over on the right side; removed the left shoulder and ribs; found very slight congestion of posterior lobe of left lung, and some interlobular emphysema; pericardial fluid bloody colored; external appearance of heart ecchymosed; internal appearance, heavily congested, almost a black color, small blood clots in both ventricles; weight of heart, four pounds. Spleen, weight, four and seven-eights pounds, presenting an engorged and disintegrated glandular structure. Liver, weight, nineteen and seven-eighths pounds, very dark colored; blood vessels filled with blood; evidence of a fatty degeneration left upon the knife-blade after making a number of incisions into the structure of the liver. Fourth stomach, internal surface congested and studded over with a number of small circumscribed abrasions, dark colored in centre, and deep; discoloration found throughout the length of

the intestinal canal; longitudinal folds of rectum black streaked. Urinary bladder healthy, containing about two quarts of very dark colored urine; specific gravity, 1010, coagulated upon application of heat and nitric acid. Kidneys, weight, right, one pound and a half; left, one and three-eighths; both kidneys containing a little bloody colored urine, the cortical portion darker than normal—a dull brown color. Muscular tissues, pale and almost bloodless, presenting the appearance in color of veal; blood in blood vessels watery, but darker in color than in cases Nos. 1 and 2.

October 8th.—A steer, owned by Henry Bressler, five miles northeast of Sterling, died last night. This steer, with fifteen more belonging to Mr. Bressler, had been in Mr. Wolf's pasture from the 20th of May until the 5th of October.

October 6th, was noticed to be sick by one of the neighbors; was found dead, lying in the creek (not the Elkhorn), in Mr. Bressler's field on the morning of the 8th.

Post-mortem appearances, No. 4.—Aged 3 years; proceeded to examine as in previous cases. Muscular tissue rather dark colored, and muscles presenting a speckled appearance; blood vessels containing a normal amount of blood, clots very strong and abundant; lungs emphysematous, and considerably congested, a slight deposit and organization of lymph, forming a small adhesion of the right lobe to the diaphragm; pericardium contained about an ounce of bloody colored serum; heart flabby and extensively ecchymosed on its external surface—contents, heavy blood clots in each ventricle, extending through the valves into the auricles, the fleshy pillars of the right side very dark colored, almost black. Spleen, weight 5 pounds, ecchymosed, and engorgement of the blood vessels of the covering peritoneum, trabiculæ broken down. Liver, weight 24 pounds, superior lobes of an olive color, lower lobes very dark and somewhat hepatized; gall bladder contained about twelve ounces of brown colored bile, and of a granular appearance—like old rancid lard. Abomasum, internal surface covered with small papillar eruptions, and several small ulcers with ragged borders; the small intestines reddened and congested throughout their entire length, and occasionally present-

ing groups of small ulcers; there was also considerable softening of the mucous coat of the intestines; contents of rectum covered with mucus and small blood clots. Urinary bladder healthy, containing about twelve ounces of grape-colored urine. Kidneys normal.

This animal was fat and had apparently not lost much in condition.

Mr. Bressler also lost a steer in Mr. Wolf's pasture about the 15th of September; was found lying dead in Elkhorn creek, where he was allowed to remain and decompose (contrary to my orders), and another one—a heifer—died a few days later.

Total loss occurring in Mr. Bressler's herd of 18 animals,—three.

Mr. David Wolf lost three head, out of a herd of eighty animals about the same time that Mr. Bressler's second one died.

Ben. Bressler, in the adjoining field, lost a cow ond a two-weeks old calf, about the 28th of September; 10 head exposed.

John Stouffer found two steers dead about the 1st of September, after missing them for a week; 14 head exposed.

(*To be continued.*)

A NOTE ON GLANDERS.

By R. S. Huidekoper, M.D., V.S.

Our colleague, Dr. J. P. Klench, commenced in the January number of the American Veterinary Review, an article "Concerning the Treatment of Glanders." I followed it closely and with interest, as it is a subject of importance to the veterinary profession and to all owners of solipeds, as well as being a subject which enters into the domain of public hygiene, in the protection of our own lives. The extracts from the journal of Dr. Klench were of great value, as he showed that, although horses which were given rest and a good tonic treatment would temporarily present the signs of a "favorable" or a "pretty favorable" termination of their disease, yet they almost always relapse into the visibly glandered condition when they are again put to work,

or are subjected to inclement weather and bad surroundings. Dr. Klench ends by saying that he "never considered such horses as cured of glanders, when no more of the disease could be discovered externally; for the germ of the disease is still existing in the body, in the blood, and is liable to burst out again under the effect of a cold chill, or a fever from any cause, traumatic or not traumatic." This sentence and the precise resumé of his elements for making a diagnosis, are lines which every reader should underscore; but yet it seems to me that the article might tempt some of your readers to undertake a treatment of glanders or farcy, which could benefit the owner of the patient by the gain of a little additional work, while it would expose him and his neighbors to the constant danger of having their other valuable animals contaminated. Each veterinarian who assumes the treatment of a case of glanders, which is in the possession of another, only contributes to confirm the opposition of the laity against any attempt toward the establishment of good American laws of sanitary police. While Dr. Klench's article is still fresh in the minds of your readers, it may be of interest to add a sketch of the laws concerning glanders and farcy, which are now in force in some of the European countries. The German Royal Cattle Disease Law, of June 23d, 1880, prescribes:

§ 40. As soon as a case of glanders is discovered, the police must order the killing of the animal.

§ 41. Suspected animals must be separated and placed under police surveillance, with such limitation or prohibition of the commerce or use of the animal as may be required by the nature of the case.

§ 42. The police must order the slaughter of suspected animals,

"When the official veterinarian considers that the symptoms render an outbreak of glanders probable,

"When without it, it would be difficult to prevent the extension of the disease,

"When the proprietor demands it, and the prompt suppression of the disease is required for the public good."

§ 43. The bodies of glandered horses, which have died or been killed, must be immediately removed with care. The skinning of them is prohibited.

§ 44. The police must make written reports to the Commander-General of the Army Corps of their department, at the first suspicion or outbreak of the disease, during its course and at its termination (extinction). If there is a garrison in the department, the commanding officer must be notified.

This law is accompanied by general instructions which prescribe that the police and the official veterinary surgeon shall study the circumstances attending an outbreak of glanders, and report the condition of the stables of the present and *former* owners of the sick animal. The attendant of a glandered horse or of an animal suspected of the disease, is forbidden to take care of other horses, or to sleep in the stable. In the absence of the police, the veterinary surgeon is authorized to carry out the law. The stalls of glandered horses must have a notice to that effect over the door. The public are forbidden to enter the stable, and the removal of harness and cleaning utensils is not allowed. Special directions are given concerning the removal of a glandered horse and the means to be employed in killing him. The body is to be boiled till the soft parts fall to pieces, or is to be burnt; where this is not practicable, the hide is cut in strips to render it worthless and the body must be buried at least 40 inches (1 meter) under ground. Where there is suspicion of glanders in a stable, the other animals can only be removed and used after a special authorization from the police. All harness and stable utensils must be disinfected. The stables must be visited by the official veterinary surgeon at least every fourteen days; horses that have been removed from the stables must always be visited at the same periods. The surveillance continues during six months. If any of the animals are sold or removed to another district, the officials of this latter must be notified. The means of disinfection are prescribed by law. When the animals have been killed and the disinfection has been completed, or when suspected animals have been declared sound by the veterinarian and no further danger is apprehended, notice is given in the official newspapers.

The law of the Austro-Hungarian Empire dates from Feb. 29th, 1880. The following are extracts:

Glandered animals are to be killed without delay. Animals suspected of glanders are to be separated and kept under the supervision of an approved veterinary surgeon. If the suspicious symptoms continue over six weeks, the animal is to be killed, or the expense of further supervision must be defrayed by the proprietor. Horses that have been in contact with glandered animals are confined to specified localities and are to be watched for two months. The further prescriptions are in general the same as those of Germany. In these countries the government pays a fair indemnity to the owners of animals which are killed on account of glanders; this is also the case in Italy.

In France, the law of July 21st, 1881, in regard to the contagious diseases, says:

"Art. 8. In the case of confirmed glanders and in the case of farcy and anthrax, if the veterinarian appointed considers them incurable, the animals must be killed by order of the mayor," etc. The use of the two terms, glanders and farcy (*morve* and *farcin*), and the possibility of treatment of the latter, was very unsatisfactory to the teachers of the veterinary schools and to the veterinary profession in general; it, however, found its way into the law to become practically a dead letter, for, throughout France farcy is regarded as glanders and as incurable, and the diagnosis of either is followed by the immediate destruction of the animal. In France no indemnity is allowed. The laws of Belgium are much the same as those of France. All commerce of glandered animals is forbidden, and a seller can be prosecuted both for the sale of such an animal and for the damage which may ensue through contagion.

Dr. Klench has clearly given the points necessary for the diagnosis of glanders, more or less developed. For determining the nature of a suspicious case, various means may be employed. In Italy and in parts of France, where donkeys have very little value, they are inoculated, either subcutaneously or by rubbing the discharge on the mucous membrane of the nose. If the matter employed is from a case of glanders, the donkey will show the disease in its acute form at the end of the first week. In the north of France, in Belgium and elsewhere, dogs are

used. Glandered matter, inoculated in the skin of these animals, produces a very characteristic ulcer in a few days, which may or may not be followed by a general infection. If, on the contrary, the glandered secretion is injected into the connective tissue, or is put on the mesh of a seton, it will be followed by well developed symptoms of the disease. The recent studies of Lœffler and Schuetz, in cultivating and inoculating the bacillus of glanders, show that the guinea-pig is a convenient and sure animal in which the glanders can be reproduced in its acute form in about eight days. The rabbit is less adapted, as in it the disease often takes a chronic course, or fails to develop. White rats are not susceptible; but in field mice the disease shows itself promptly. The German discoverers of the bacillus employ the following formula for coloring the microbe, in microscopic sections, or in glandered matter, dried on the glass cover:

1st. Color in a concentrated watery solution of methyl blue.

2d. Wash in very dilute acetic acid.

3d. Extract excess of water by alcohol.

4th. Mount in balsam (cedar-oil).

While Lœffler and Schuetz describe the bacillus as being a rod, similar to that of tuberculosis, discovered by Koch, Israel finds two forms, one "smaller," the other—which he considers the real one—the same length as that of tuberculosis, but thicker and containing larger spores. Dr. Wosnessensky, in the laboratory of M. Chauveau, also finds two forms like Israel, but in examining the same cultures at more advanced periods, he has found that the form is not stable, but at times there is a sort of mycelium in the form of an L, and moreover a tendency to the formation of spores in a bed of protoplasm.

It is evident that this study is in its beginning and all that is yet proved is, that the cause of glanders is a parasite. One reason for the difference in the form of the bacillus in Germany and France, is, probably, that the Germans use the coagulated serum as a medium of cultivation, while "bouillon" is more generally employed in the French laboratories. The microscope should magnify 700 or 800 diameters in order to show the microbe clearly.

ACTINOMYKOSIS: A NEW INFECTIOUS DISEASE OF ANIMALS AND MANKIND.*

By George Fleming, F.R.C.V.S., Army Veterinary Inspector.

(*Continued from p.* 62.)

ACTINOMYKOSIS IN MAN.

In mankind, so far as I am aware, only sixteen cases of the disease have as yet been recorded, Dr. Ponfick having observed no fewer than five. All the cases published hitherto have occurred, I believe, in Germany. They are tabulated as follows by Johne:

No.	Observer.	Diagnosis.
1	Israel	.....Chronic Pyæmia. Death. *a*
2	Do.	.....Inflammatory Tumefaction of the alveolar processes of lower jaw, with deep-seated Abscess. Recovery. *b*
3	Do.	.....Subperiosteal Abscess at the margin of the lower jaw, coincident with Caries of the third molar. Recovery. *c*
4	Do.	.....Chronic Pyæmia. Death. *d*
5	Ponfick	.....Prævertebral Abscess. with Caries of the vertebræ. Death. *e*
6	Do.	.....A similar case, and fatal termination. *f*
7	Do.	.....Abscess after extraction of an upper molar tooth, immobility of the jaw through cicatrization, Fistulæ in the temporal muscle and upper part of the neck. Death. *g*
8	Do.	.....Prævertebral Abscess, opening into the jugular vein, Metastatic Tumor in the heart, Actinomykotic Periand Myocarditis. Death. *h*
9	Do.	.....Ulceration of the jaw and Abscess. Partial resection. Recovery. *i*
10, 11, 12, 13	Rosenbach..	Actinomykosis Tumefactions, with deep-seated Abscess. Recovery. *j*
14	Kracke	.....Particulars not known.
15	Esmarch	.....Particulars not known.
16	Weigert	.....Peripleuritis.

*From the Veterinary Journal.

a Virchow's Archiv, Bd. 74, s. 15. *b Ibid*, Bd. 74, s. 37. *c Ibid*, Bd. 74, s. 41. *d Ibid*, Bd. 78, s. 421. *e* Breslauer arztlicher Zeitschrift, 1879, s. 116. *f Ibid*, 1879, s. 117. *g Ibid*, 1880, s. 151. *h Ibid*, 1880, s, 151. *i* Mittheil. v. d. Naturf.-Vers. zu Danzig. Berlin Klinik Wochenschrift, 1880, s. 42. *j* Centralblatt fur Chirurgie, 1880, s. 225.

I cannot do more here than briefly refer to some of these cases, to show their relationship to those occurring among animals.

Professor Ponfick's original case was that of a powerfully-built man, aged forty-five, who had suffered from the sequelæ of pleurisy on the left side for a year and eight months. After death, there was found an extensive prævertebral phlegmonous inflammation in the posterior mediastinum, with a parapleuritic abscess-cavity extending both to the right and left, at the level of the seventh, eighth, and ninth intercostal spaces; with this cavity there communicated a complex system of sinuses, extending through the substance of the longissimus dorsi, the scapular muscles, and the subcutaneous tissues of the whole back. The sulphur-yellow fungus-bodies were found upon or between the granulations of these sinuses and in their substance, as well as in the sero-purulent discharge; they were also found in a cavity of the size of a cherry, which occupied the centre of a hepatised area of the left lung (lower lobe), as well as in the exudation that filled some of the neighboring alveoli. The second case was that of a woman aged sixty-one, admitted with an abscess of the lower part of the abdominal wall; she subsequently developed another abscess of the left iliac fossa, without recurring symptoms of peritonitis, and died from exhaustion. After death, caries (with prævertebral collection of pus) of the three lower lumbar and first sacral vertebræ, abscesses in both iliac fossæ, and perityphlitic adhesions, were found. The yellow fungus bodies were discovered in the pus of the prævertebral abscess. The third case was that of a woman, aged forty-five, who had suffered an injury of the right thumb three years before, with swelling of the arm, which did not subside, but extended to the neck and back, and was accompanied by progressive weakness. The necropsy revealed extensive sinuses on the left side of the neck and in the prævertebral tissue, a knob-like excrescence of new growth extending into the lumen of the internal jugular vein, a tumor, of the size of an apple, growing into the right auricle and ventricle, with corresponding whitish centres in the ventricular substance, and gelatinous nodules in the spleen and

in the occipital lobe of the right cerebral hemisphere. In this remarkable case, the fungus-bodies were found in the sinuses of the neck, in the substance of the sarcoma-like growth of the jugular vein, in the tumor of the right auricle and ventricle, and elsewhere. In the fourth case, the illness began fourteen months before death, following the extraction of an upper molar tooth; it consisted of swelling in the region of the right maxillary joint, tumefaction of the face, and subsequently of the neck; successive outbreaks of abscesses and sinuses in these regions. Death occurred from extreme exhaustion. The yellow fungus bodies were frequently obtained in this case from the sinuses during life. The record of the case is too elaborate to be given, even in outline, but it may be mentioned that there was, besides the extensive sinuses and granulation-centres of the face and neck, a prævertebral abscess extending from the basilar process of the occiput to the fourth dorsal vertebra, with osteophytic growths from all the bones, together with caries of both occipito-atlantal joints and of the right atlanto-axial. In the fifth case—a boy—the first indication of illness was a year before death, when he had symptoms of pleurisy; nine months later, there was a new and much more severe affection of the same side, with general dropsy, progressive swelling in the lower part of the back, and evacuation of pus from a cavity opposite the eleventh left rib. *Post mortem*, a large prævertebral cavity was found on the left side, partly retropleural at the level of the eighth, ninth, and tenth ribs, and partly retroperitoneal at the level of the last two ribs and the left kidney; also several perforations of the diaphragm. There were numerous centres of Actinomykosis in the muscles of the back, in the intercostals, and in the left psoas muscle; also in the muscular substance of the left ventricle, and in the upper end of the spleen.

In Rosenbach's cases, the disease commenced in the neighborhood of the jaws, and appeared to be in some way dependent upon carious teeth, involving the dental alveoli. Ponfick and Israel had remarked on this tendency of the disease to originate in the teeth or their sockets. This local affection is not unfrequently followed by metastatic abscess in the liver, spleen, intes-

tine, and muscles. Death seems to result from chronic pyæmia, or from exhaustion, as a consequence of protracted and pernicious suppurations. In mankind the tendency of the disease is to the formation of abscesses and suppurations; in bovines, to tumors and small nodules.

In all the detailed reported cases occuring in man, there have been found, in the pus of the abscesses, immense quantities of small nodules, the majority being the size of a pin's head, sulphur-yellow in tint, and generally soft and tallowy in consistence. These are agglomerations of the *Actinomyces*.

The Actinomyces.

The botanical character of the *Actinomyces* does not seem to be yet clearly established. Harz, who first studied its morphology and biology, was inclined to consider it as belonging to the class of moulds (such as the *Penicillium glaucum*), but Karsten thought it should be included among the *Coniomycetes*, as the "rust" and "smut" of cereals and grasses, and therefore belonging to the *Ustilaginæ*. So long ago as 1870, Professor Hahn, of the Munich Veterinary School, had discovered in a case of "Wooden Tongue" (*Holzzunge*) characteristic organized bodies, which looked like a kind of brush-shaped mould. When Bollinger drew attention to the disease in 1877, and to the presence of these fungi, Harz made a special investigation of them, and from their eccentric radiating structure gave them the name of *Actinomyces*. As has been already shown, the fungus is contained in nodules which are often soft or puriform, and forms a pale-yellow, brownish, or greenish-yellow, globular tuft, which, under a low microscopical power, offers a radiating arrangement of its substance, from the centre towards the periphery, reminding one somewhat of the crystals of certain fat acids. The larger of the tufts, which generally are composed of two or more mulberry-shaped masses, often appear to the naked eye as very small, millet-sized bodies. When properly prepared and highly magnified, if the nodules were embedded in tissues, they are observed to be composed of a kind of fibrous capsule; within this a layer of cells, for the most part of a lymphoid character; nearer the

centre are larger cells, like ordinary epitheloid cells; and in the centre the *Actinomyces* clusters.* Iodine, anilin, and picric acid give these a characteristic reaction, the cell-membrane generally offering a cellulose reaction. Alcohol, æther, acids, and alkalis have no immediate effect upon the fungus tufts, and this distinguishes them from such bodies as fat crystals. By pressure, the globular tufts can be broken up into numerous kinds of wedge-shaped pieces of various sizes, from 0.010 to 0.050 millimeters in length, and the majority are about equal in breadth towards the end. Each piece is composed of a great number of individuals, every one of which is somewhat conical, from 0.0005 to 0.0020 millimeters broad, about 0.0045 millimeters long, representing the mycelium, from which begins a central base-cell or basidium. From this arises a two to nine-stalked hyphen, from 0.0005 to 0.002 mm. in diameter, and at the extremity of the stalks or sterigmata are the conidia.

CONTAGIOUS DISEASES IN KANSAS.

By A. A. Holcombe, D.V.S.

A bill was presented in the Legislature of this State during the session of 1881, which had for its object the creation of the office of State Veterinarian, and the adoption of such measures and regulations as should look to the prevention and suppression of contagious diseases among the domestic animals of the State. For various reasons the bill failed to pass. During an interval of the next two years the question received serious consideration at the hands of many of the most thoughtful stock owners and breeders in the State. Foremost among these was Governor Glick, one of the most successful practical breeders of blooded stock in the State. In his message to the Legislature in Jan., 1883, he strongly urged the necessity for action in the matter; but not-

* A good method of showing the *Actinomyces* is to cut sections, and stain them singly with Spiller's purple, or doubly with it and diluted soluble blue. To demonstrate the separate parts of the nodule, a small portion may be teased out in glycerine.

withstanding he was ably seconded by many members of the Legislature, no action was taken further than the introduction of two bills. Of these two bills one was drawn almost similar in its provisions to the laws now in operation in Wyoming Territory and the State of Illinois. The salary was named at $3,000 per year, with a contingent fund of $2,000 per year. But this provision was so modified by the committee to which the bill was referred, that had it passed the law would have been practically inoperative for the want of an officer with sufficient ability to fill the position. Further, other provisions were so modified that even an able officer could have accomplished but little or no good. So, for two more years we are left to the ravages of all the diseases which may affect our animals, without any hope of relief from our authorities. That we are not in imminent danger from the importation of diseases new to us, may be true; but we have not been wise enough to adopt such precautions as might prevent the introduction of pleuro-pneumonia, foot and mouth disease, or other contagious disorders. Still worse, we are utterly at the mercy of these diseases should they be introduced; for we are without means by which to detect their introduction, and without measures to prevent their spread. That foreign cattle are coming to our State in considerable numbers is known to all; that they are free from contagious diseases we have no satisfactory assurance.

But even were we free from outside danger in this regard, we need relief from the losses inflicted by the diseases we already have. With $60,000,000 worth of live stock in the State, we have, I am informed, but *one graduated veterinarian* in civil practice, and yet I am aware of large yearly losses from glanders, farcy, anthrax, hog cholera, tuberculosis, cerebro-spinal-meningitis, scab, Texas fever, contagious ophthalmia, and (so report says) hydrophobia. Of course, the veterinarian who must depend on private practice for a living can do but little for the sanitary policing of the State, and his accidental contact with diseases is about the limit of his influence with regard to their suppression. Practically there are no reliable statistics in the State of the losses from the various diseases, nor will there be until educated veterinary surgeons have the opportunity to investigate their frequency, extent and mortality.

The State has neglected her duty in this regard, and daily pays the penalty, which I am sure cannot be a light one. We are in great need of a State Veterinarian, and as greatly do we need many civil practitioners.

EDITORIAL.

INOCULATION IN CONTAGIOUS FEVERS.

The truth of the germ theory in the development of contagious diseases, and the value of inoculation as a prophylactic against these affections, have in the past few years found a long list of investigators in Europe, and while many of the facts advanced by Pasteur have found their supporters in various countries on the continent, they have also been rejected by a few. And while Germany has produced the most serious opposers of the experiments of the celebrated French chemist, recent discussions which have taken place at the Academy of Medicine in Paris seem to show that the great results obtained by the new discoveries are not yet endorsed by all the professors of either human or veterinary medicine.

Pasteur's discoveries and invention of a process for attenuating the virus have been followed by the investigations of others, amongst whom must be mentioned the names, now celebrated, of the two French veterinarians, Toussaint and Chauveau. America has not, however, remained ignorant of the good work which could be realized in the new direction, and new investigations of the causes and prophylaxy of contagious diseases. Dr. E. Salmon, a graduate of veterinary medicine of Cornell University, has followed from the beginning in the path opened by the European workers.

As early as in July, 1880, that is, *nine months before Chauveau made his communication before the Academy of Sciences*, he had made experiments in the effects of inoculation made with diluted virus, and he has since kept them up and applied this method to his thorough investigation of fowl cholera, as his extensive and elaborate report, published in the Report of the Commissioner of Agriculture for 1881–82, shows.

We have in this REVIEW completed an article of his on the important question of the productiom of immunity by inoculation with diluted virus, which will, no doubt, show that Dr. S. is quite master of the subject, and that the appointment which he has just received from the Commissioner of Agriculture was well deserved, and will prove but another opportunity for him to continue in the completion of this interesting work.

We also publish an article from M. Chauveau, presented to the Academy of Sciences, on a new method for the preparation of attenuated viruses, the process being no longer carried on by the influence of oxygen, as in the mode of Pasteur, or by dilution, as in that of Salmon, but by the action of heat, a process which seems, for many reasons, likely to take precedence in general practical application over that which is now generally in use on the continent of Europe.

It will be gratifying to the veterinary profession of America to learn that, young as she is in the field, she is already making her mark in the most important department of their calling, viz., that of the prophylaxy of contagious diseases.

REPORT OF CASE.

HYDROTHORAX—TUBERCULOSIS IN A RHINOCEROS.

BY A. LIAUTARD, M.D., V.S.

Mongo was a huge female rhinoceros, which since the age of three years had been one of the attractions of the "greatest show on earth," the property of Barnum, Bailey, Hutchinson & Co. Aged 16 years and weighing about 5,000 pounds, she had always enjoyed apparent good health. She was of a kind disposition, had always fed well, never coughed; drank about five pails of water a day. All that was noticed about her was that for the last three months she had a peculiarity of resting her throat over the edges of her cage, breathing then with difficulty, remaining in that position for a few moments, going about in her cage, to resume again the same position. This winter she has seemed somewhat delicate in feeding, eating about 10 quarts of oats and meal a day, a dozen of carrots, a couple of loaves of bread, and

about 50 pounds of hay sprinkled with water. She came from the winter headquarters at Bridgeport to the Madison Square Garden on Wednesday morning, the 19th of March. In the evening, at eight o'clock, she looked as usual, and was fed. The next morning, when her keeper opened her cage, he found her lying down, dead, in a position indicating that she had succumbed almost without a struggle, her bedding not being disturbed in the least, and no special noise having been noticed during the time by the watchmen.

She was brought in her cage to the hospital of the American Veterinary College, where a post-mortem examination was made by me, assisted by Dr. Coates and the two house surgeons, Drs. Kay and Critcherson.

On the opening of the cage the animal is found lying on her right side, the legs folded under the body, in her usual position, the head resting on the floor; the body is in good condition. A bloody mucus discharge escapes from both nostrils. Dragged outside of her cage by a number of men with ropes and pulleys, she was lowered on two dissecting tables, placed on her back, and her extremities secured to standards at each corner of the table.

An incision was then made on the median line of the body, from the chine down to the pubis, and the skin, which was found more than an inch thick, was dissected from the body. The abdominal muscles being removed, the internal viscera were exposed and taken out. The entire mass of the small intestines seems to be healthy, except in the anterior portion, and contain a bloody fluid; the mucous membrane is somewhat congested, and in some parts of a dark color and softened. This condition exists principally at the anterior extremity, or about a foot and a half from the pylorus. The large intestines are filled with fecal matter, the mucous membrane being slightly congested and softened.

On removing the stomach, a large nodulated tumor shows itself, between the æsophageal and pyloric openings, at the small curvature, filling it in its whole extent, round in its principal mass, and showing shoots of hard masses running alongside of the small curvature of the pyloric portion of the small intestine. This tumor is a tuberculous mass, hard, indurated, which on section shows a dense, fibro-granular aspect. In the single stomach

was found a certain quantity of food. The mucous membrane of the cardiac portion is normal, and covered with the porcelain-like structure, continues to the æsophagus. The pyloric portion presents three ulcerated patches; one about the size of a twenty-five cent piece, with well-defined, indurated edges, the center of the ulcers being flattened, soft, and of a pale reddish color.

The spleen is apparently perfectly healthy, presenting, however, towards the lower extremity, a few tuberculous deposits, situated in the fissure of the organ. One of them, about the size of a large walnut, is held in place between the layers of the great omentum.

The liver presents four lobes, is normal in color, perhaps a little softened, and offers on its nodulated surface a few tubercles, scattered irregularly. In the center of the hepatic structure is found a large tubercle, near the right lobe. The kidneys are lobulated, of dark color, slightly softened. The suprarenal capsules are enlarged and hardened, and also contain tubercular deposits. The mesentery and other parts of the peritoneum look normal. In the pelvic cavity a large mass of whitish-opaque albumoid, homogenous jelly-like structure is found, weighing about two pounds. The ovaries are large and healthy. The bladder contains but little healthy urine. In removing the uterus, the large mass shows the horns and the body of the organs covered by a large number of tuberculous masses, the largest about the size of a lady-apple. The mucous membrane slightly colored.

The sternum was then removed by section of the costal cartilages. In doing so, a large quantity of a clear, serous effusion escapes into the then empty abdomen. Measured, it is found that the thorax contains about twenty-eight gallons of this fluid, which has filled the cavity of the chest to nearly three quarters of its extent, squeezing the lungs in the upper portion of the chest, and producing a carnified condition of those organs. The lungs are adherent to the thoracig walls by strong fibrous bands of a dark bluish color. The right lung is in a hyperstatic condition, the anterior lobe of that lung being extensively emphysematous along the lower border. The surfaces of both lungs are filled with tubercular deposits, very heavy and dense. On section, the lungs allow the escape of a reddish fluid, which is

oozing from the divided surface, and numerous miliary tuberculous deposits are found in the whole pulmonary structure. The mucous membrane of the bronchii is congested, of a livid color, and their cavity is filled with frothy mucus.

The heart weighs about fifteen pounds. Its external appearance is healthy. The two venticles are empty. There is a certain atrophy of the walls, and small calcareous deposits on the tricuspid and semi-luner valves. The pericardium is adherent to the pleura and to the lungs by strong fibrous valves. The pericardiac and cardiac lymphatic glands are greatly enlarged and indurated, and slightly nodular on the surface. Three large tubercles are attached to the superior face of the sternum. The axillary lymphatic glands of both sides are very much enlarged, as are the pectoral, propectoral and lymphatic glands of the neck.

Microscopical examination of some of the glands, made by Dr. Peabody, pathologist at the New York Hospital, is reported as follows:

"I have just examined sections from the lymphatic glands, liver and skin of your patient, the female rhinoceros. I have never seen more typical or more beautiful illustrations of tuberculosis than the two former present. There are relatively few areas of caseous degeneration in my sections. I have never seen more perfect giant cells than these sections show, nor have I ever found them so numerous in any human tubercle. The skin is normal, so far as I have cut it.

"Very truly yours,

"NEW YORK, April 14, 1883." "G. L. PEABODY.

EXPERIMENTAL PHYSIOLOGY.

DIRECT AND RAPID ATTENUATION OF VIRULENT CULTURES BY THE ACTION OF HEAT.

BY M. A. CHAUVEAU.

The present subject has perhaps a great practical importance I will explain further on. For the present it treats principally of the general physiology of viruses, in the study of which I have

made many experiments upon the *Bacillus* anthracis, with the intelligent assistance of Dr. Jean Wesnessenky.

The former researches of Toussaint, confirmed and explained by M. Pasteur, have demonstrated that the heating of the anthrax blood is susceptible of diminishing considerably the virulency of the *bacilli* which it contains. I have also demonstrated that this attenuation can be graduated, at will, so to speak, in varying the condition of the heating process. I will now prove that this heating, considered as a means of pseudo instantaneous attenuation of viruses, can be applied to the liquids of artificial culture with much more success than to the natural fluids of the animal economy; liquids whose manipulation is difficult and delicate, while that of the culture is as simple in the processes as it is sure in the results. I proceed as follows:

In sterilized bouillon I sow anthrax blood. The matrasses are then placed in a thermostat, kept at the temperature + 42° to 43°, as in the Pasteur process. But instead of leaving the matrasses during twelve or thirteen days in the thermostat they are taken from it after about twenty hours, to be submitted in another thermostat to the temperature of + 47°, during one, two, three hours or even more. The operation is then finished; it has not destroyed the vitality of the virulent agents of the culture, but they have lost more or less of their nocuity, according to the length of time they have been heated.

The first step of the operation, the sojourn of twenty hours in the thermostat heated at + 43° corresponds to the stage of proliferation of the virus. There is nothing particular to remark upon the preparation of the cultures. I use light and very clear chicken bouillon, in which I place one drop of blood, rich in carbuncular batonnets. I prefer this to the spores of a previous culture in order to avoid the danger, undoubtedly imaginary, which would result from the non-transformation of some of those very resisting agents. Indeed, the important point is to obtain, in the cultures, virulent agents under a form which leave them very accessible to the influence of heat. This indication is thoroughly realized in the conditions mentioned. The bouillon is soon cloudy by the formation of a mycelium, which breaks up in small

threads or short batonnets, analogous to the *bacilli* of the fresh blood upon which heat has such an effective action.

The second step, corresponding to the stage of attenuation, does not require any delicate manipulation, any more, in fact, than the first. Removed from the thermostat at + 43°, the matrasses are placed in the second warming apparatus, after taking a small pipette of the liquid, to test the activity of the cultures. Two factors act in the attenuation which heat gives to those cultures: the degree of elevation and the length of time of the exposure to that high temperature. If the strength of the first of these factors diminishes, that of the second must increase, and *vice versa*. From numerous experiments it results that a heating of three hours at a temperature of + 47° is sufficient to transform into agents harmlesss to the guinea-pig, the fluids and batonnets of cultures primitively very virulent.

Heating does not modifiy the external aspect of the cultures. Indeed, it prevents in them, all proliferations of threads and batonnets, although it does not prevent development of the rudimentary spores. On the contrary, heating stimulates their multiplication or causes them to appear when they did not previously exist.

I have said, that with this method, the attenuation of the cultures can be graduated at will, in giving to the heating a duration in relation to the degree of attenuation it is desired to obtain. This is one of the interesting points of my researches. To reach a greater certainty and give to the results of my experiments in inoculations every reliability, I always inoculated guinea-pigs by injecting under the skin of the thigh one or two drops of the liquid, according to the size of the animal. In those conditions, if one tries comparatively the same liquid of culture, supposed to be very active, before and after the heating, during one, two, three, or four hours, this is what he observes: all the animals inoculated with non-heated liquid die rapidly, that is, in about forty-eight hours, with a large ædema. Those which have received the liquid heated for one hour, die also, almost all, but death takes place generally later that in the first. The liquid heated two hours is much less active, as,

amongst the animals which have received it, some die slowly, with a slight local infiltration, while others, in at least equal numbers, resist and survive. The liquid heated three hours does not kill adult animals, nor even produce sensible local accident; *a fortiori*—it is the same with the fluids heated during four hours, and even more. And the virulent agents contained in these harmless liquids have preserved their prolific faculty; an important point to be hereafter considered.

From the experiments that I have made, the primitive virulency is in inverse, and its attenuation in direct ratio of the number of rudimentary spores which alter the homogenity of the protoplasm of the threads and of the batonnets.

It is, then, shown that heating is an excellent means of, so to speak, attenuating instantaneously virulent cultures prepared in certain conditions. If this attenuation could be considered as the indice of a specific transformation, one could not hesitate to place heat amongst the most important agents to give to the protoplasm in way of evolution derivation of transformation.

—*Revue Scientifique.*

ON THE PROLIFIC FACULTY OF VIRULENT AGENTS ATTENUATED BY HEAT, AND THE TRANSMISSION THROUGH GENERATION OF THE ATTENUATING INFLUENCE OF A FIRST HEATING.

By M. A. Chauveau.

One can assure himself in two ways that the attenuation by heat does not imply any alteration of the vitality, or of the prolific faculty, of virulent agents which have been deprived of their infectious properties by such action: 1st—Through means of the culture of the first generation itself, submitted to heat, in showing that the growth has only been temporarily suspended by that operation. 2d—Through the cultivation of the second generation, in showing that the seminal element furnished by the liquid of the primitive culture, before the return of its development, fecundates perfectly a new ground.

To utilize the first process, it is sufficient to place the matrasses

of culture, taken from the oven at + 47° in another, heated only to + 32°–35°. The evolution then begins again its normal course; the proliferation continues, and the development terminates by the formation of a great number of true spores. By the general aspect of the microscopic characters, these cultures do not differ sensibly from those which have not been submitted to these special conditions, unless the exposure to heat has been too long continued. In general, four hours of heating at + 47° does not prevent the following evolution, or scarcely disturb it.

The attenuating influence of heating of the cultures is not only temporary; it can be transmitted to a certain extent, when these cultures resume their course of evolution, to the spores born from the protoplasm of the threads and batonnets, which have received the action of heat.

But where the transmission of this effect of heat is specially manifest, is in the facility with which these spores are brought under the weakening influence of a heating process applied directly upon them. Nothing is easier or more simple than to render them almost absolutely harmless, by exposing them for some time to the action of a given temperature. I call attention to this new fact, which possesses special interest. It is not impossible to obtain a similar effect with the spores of normal origin, though rightly they are considered as susceptible of a strong resistance to causes of destruction, particularly to the influences of comparatively high temperatures. But these spores may be left, with impunity, for one hour or one hour and a half, exposed to a temperature of + 80°. They do not then undergo any sensible alterations in their morphological character, nor in their physiological properties. It is not so any more with spores of culture whose growth has been temporarily interrupted by heat. In this condition, this affects the objective character of the spore, which seems to become smaller, but is also greatly modified in its virulent activity. The culture can then be inoculated, without great risk to life, to guinea-pigs, and especially to sheep, which thus obtain immunity, as well as with any other preventive inoculation.

The culture of the second generation may, as well as this first means, prove the persistency of the vital activity of threads and

batonnets developed with the thermometer at + 43° and rendered inoffensive by the action of heat at + 47°. It is proper to say a few words of this second means, which furnishes also excellent evidence to demonstrate that the effect of heat is graduated as well as its duration. In each of three matrasses heated at + 47°, during one, two and three hours, I take, with a pipette, a certain quantity of liquid. Three other matrasses being prepared, I put in each one or two drops of the liquid. They are then sowed with the threads and batonnets, attenuated by heat. These last matrasses are then put in, the thermometer showing + 32° to 35°. What will take place in these cultures of second generation? Exactly what will in the primitive one, after the renewal of the process of growth. The culture of the second generation develop themselves, in fact, just so much more rapidly as the heat in the sowing has been less, and the difference of aspect which results from it may continue for several days. All, however, results in giving spores of handsome appearance, possessing the same properties as those of the primitive cultivation, especially that of their aptitude of attenuation by heating.

From the whole of this study it results that the attenuating influence produced by heat upon virulent agents is not alone individual; it can also be felt even upon the properties of the new agents to which the proliferation of the protoplasm from which it is derived gives birth.—*Academie des Sciences.*

SOCIETY MEETINGS.

NEW YORK STATE VETERINARY SOCIETY.

The thirteenth regular meeting of the New York State Veterinary Society was held at the American Veterinary College, on Tuesday evening, May 8, 1883, at eight o'clock, with the President, Dr. Liautard, in the chair.

The minutes of the last meeting being read and approved, Dr. Coates then read the following paper:

ASTHMA.

Broken wind is the name commonly applied by horsemen to asthma, and since asthma is an exceedingly rare disease, this expression is, when so generally applied, clearly a misnomer, and does not necessarily, nor scarcely ever, imply that the horse is suffering from asthma. When I state that it is rarely seen in the horse, it might be well to add that it frequently occurs in dogs. The object of this paper is to call the attention of the veterinary profession to the fact that under the present use of the term, "broken wind," other diseases are included which ought to be excluded, for the reason that from asthma they are readily differentiated.

Amongst those diseases which are so apt to be confounded are pulmonary emphysema and "roaring," the latter term being simply symptomatic of some pathological lesion of the larynx, and sometimes of the trachea. Now, to my mind, there should be no difficulty, according to the morbid anatomy of these named conditions, in discriminating between them.

In pulmonary emphysema, or "heaves," the lesion consists of an abnormal accumulation of air in the air cells and in the interlobular connective tissue, with a dilatation of the vesicles either with or without a rupture of their walls, and these walls rupturing gives rise to that condition known as air sacs, which varies in size in accordance with the amount of tissue involved in the process; these conditions are known as vesicular and interlobular emphysema. Asthma is purely functional, viz.—a spasmodic contraction of the bronchial tubes, while emphysema is organic, having a structural change; yet these conditions may be associated with each other, still they are distinguishable, as asthma is a disease *per se*. Literature on this subject leads us to suppose that in the past it prevailed extensively, but our experience at the present day does not bear this out. This great lessening of its frequency is undoubtedly due to the application of the progress of the science, resulting in an elimination of heredity, hygenic surroundings and feeding, which enters so largely into its etiology. Asthma is a spasmodic contraction of the involuntary

muscular fibres of the bronchial tubes, giving rise to paroxysms of dyspnœa, which are due to reflex nervous action. It is a non-imflammatory disease, and may be regarded as a neurosis depending upon a peculiar diathesis. The dyspnœa may be constant, with exacerbations and remissions at times, and the paroxysms may or may not be accompanied by catarrhal symptoms; if these occur, they may either precede or follow the attack, yet this disease is strictly non-imflammatory. An inflammatory condition of the mucous membrane of the bronchial tubes certainly acts as an exciting cause; this is of itself an irritation which gives rise to reflex tonic spasms, but a peculiar condition of the nervous system must exist, otherwise the paroxysms would not be produced. In animals suffering from organic disease of the heart or lungs, it is likely to arise. Asthma and pulmonary emphysema have been confounded and considered by some veterinarians as one and the same disease; although very frequently associated, they are distinct affections, and each may exist independently. It is a neuropathic affection, and no appreciable lesion is found on post-mortem to indicate its presence, and has no anatomical characteristics. Co-existing, as it may, with bronchitis and pulmonary emphysema during life, the lesion which tells of their having been present only are appreciable.

Etiology.—Its causes may be divided into predisposing and exciting. The predisposing cause is due to some peculiar susceptibility or constitutional diathesis, which is generally hereditary and transmitted from an animal to its offspring, and this may manifest itself at any period of life. It may also be acquired, and the animal acquiring it transmits to its offspring. The exciting causes are various. It may be produced by irritants directly to the bronchial mucous membrane, or from some reflex origin situated in distant parts, and again it may occur as a complication of some other disease. It originates from inhalations of smoke, irritating gases, emanations of hay, etc. Noxious substances present in certain atmospheric conditions excite it. I recall an instance where a gentleman demonstrated beyond a doubt, that in an animal of his it was caused by inhaling fumes of sulphur; for so soon as the animal was led into a barn where sulphur had been burned, it im-

mediately exhibited all the symptoms of asthma, the attack presisting until the animal was moved from that atmosphere. Emanations from the soil in certain localities is an active agent; overloading of the intestinal canal by bulky, indigestible food, as musty or coarse hay, when the nutritive qualities are limited, excite it.

Symptoms.—The initial symptom which attracts the owner's attention is the dyspnœa coming on suddenly, and this usually manifests itself after the animal has been driven, or, in some instances, it occurs a short time after feeding. This difficulty in breathing is accompanied by a wheezing sound, sometimes heard a distance from the animal. The animal stands with outstretched legs, elbows turned out, head elevated, nostrils widely dilated, endeavoring to catch all the air possible; the thorax is fixed and breathing abdominal, respiration labored, jerky in character and greatly accelerated, the flanks rising with inspiration and falling with expiration. The inspiratory act is short, while the expiratory is prolonged and terminates in a sudden effort at expulsion. The visible mucous membranes are red, and in extreme cases become livid, due to the non-oxygenation of the blood; the eyes may become prominent and the countenance anxious. The pulse during the paroxysm becomes small and feeble. If coughing is produced, it has a short, dry, peculiar character, known as the "broken-winded cough," and in some instances the coughing is accompanied by a scanty discharge of a watery secretion from the nostrils, and during these coughing spells flatus is emitted from the anus. There is abdominal enlargement, presenting that appearance commonly known as "pot-bellied," providing the animal is dyspeptic. These symptoms, continuing for a longer or shorter period, cease, leaving the animal in an exhausted condition, which passes off in a few hours. In some cases these paroxysms may continue for two or three days, if not relieved by medicinal agents. On physical examination there is found, on percussion, an increased pulmonary resonance over the whole thorax; on auscultation, sibilant and sonorous rales are heard over both sides of the chest, and a diminution of the respiratory murmur. If the spasm is associated with bronchitis, mucous rales will be heard, changing their position.

Differential Diagnosis.—It is important to distinguish asthma from other diseases of the respiratory tract; and the one it is most likely to be confounded with is pulmonary emphysema. Asthma is differentiated from emphysema by its violence, and by the absence of dyspnœa during the interval between the paroxysms. In emphysema the cause of the dyspnœa is found in organic lesions, while asthma is functional; the breathing in emphysema is always difficult, with a double expiratory act, the ratio between the inspiration and expiration being about one to three; there is no interval of paroxysms, although it is increased during exercise. The physical signs will greatly aid the practitioner: being wheezing in character in asthma, while they are more sonorous in emphysema, with prolonged expiration. Roaring could hardly be mistaken for asthma, as the sound is produced in the larynx, and besides the absence of the other physical signs and the regular rhythm of the abdomen during respiration.

Treatment.—It should be borne in mind that your first indication is directed to the relief of the paroxysm, and this having been accomplished, then institute measures to prevent their recurrence. When called to see an animal suffering from asthma, the first thing to be done is to ascertain, if possible, the exciting cause, and if it still exists, remove it. If you find that overfeeding is the cause, give a cathartic in order that the intestinal tract be unloaded, and place the animal in the most favorable circumstances for relief. The history will greatly influence you in the proper remedies to select, as being best adapted for each particular case. All are not relieved by the same agents; in some instances by the use of sedatives we obtain the desired result, while in others stimulants effect it. Among sedatives the most effectual are opium, ether, nitrite-amyl and belladonna. These give relief by acting upon the nervous system of the lungs, or on the general nervous system. Inhalations of ether or nitrite of amyl or chloroform will relieve the spasm. As a stimulant alcohol is the most preferable, also carbonate of ammonia, and will be borne in large doses. During the interval between the paroxysms, the treatment should be altogether hygenic, and by the observance

of this rule, you lessen the tendency to another attack. These animals are usually dyspeptic, hence proper care should be persisted in in regard to their diet, also tonic and stimulants to the intestinal canal, as strychnia and belladonna, with an occasional purgative.

A long and lively discussion followed, in which Drs. Crane, Dixon and Lockhart took principal part, and the majority agreed to the English version of the term broken-wind, which is pulmonary emphysema.

A vote of thank was extended to the essayist. On favorable report from the Board of Censors, Dr. S. K. Johnson was elected to membership. Dr. Kay proposed the name of Dr. H. W. Bath for membership.

The President proposed the subject for discussion at the next meeting—scarlet fever in horses. On motion of Dr. Coates, the Secretary was directed to notify the members of the subject for discussion at the next meeting and to request their attendance.

Motion to adjourn was carried.

W. S. Devoe, D.V.S., *Secretary.*

CORRESPONDENCE.

HYPERTROPHY OF THE HEART.

Bremen, Ind., April 10, 1883.

Editor Review:

I herewith report a case that in some respects is very remarkable, which may be of interest:

About two years ago I was called to treat a case which had every symptom of colic, but which upon investigation proved to be hypertrophy of the heart. I treated the horse for colic, and for a time he seemed to improve, but subsequently he was again taken with about the same symptoms. I then gave anti-spasmodic treatment, but instead of improving, he seemed to grow worse. I then made a careful examination of the heart and its sounds, and found it very irregular, intermitting, with audible valvular

regurgitation. I placed him upon tonic, alterative and anodyne treatment. I was, however, unable to arrest the now—to my mind—thoroughly established disease of the heart. A few days since the horse died, and upon post-mortem examination I found the heart enlarged to at least twice—or nearly twice—its normal size.

I hope the foregoing may be of interest to your numerous readers, taking, first, the conditions, viz., the colicky symptoms; 2d, the valvular regurgitation; 3d, the intermittent pulse; 4th, the cartilaginous texture, of which I omitted to speak in the proper place, and, 5th, the gritty or rough feeling of the divided organs.

C. H. Gollatz, V.S.

INFLAMMATORY RHEUMATISM.

Editor American Veterinary Review:

On the 4th day of April I received a dispatch from Mr. Van Benthem, of Osage County, Kansas, requesting me to see a herd of thorough-bred young bulls, coming two years old. I complied on the 5th. Two were permanently down; when raised could not stand; had them sent over to the barn and slung; they belong to a herd of sixty-four head, all bulls, and extremely fat; have been full fed from their infancy. During last winter and up to this time they have been fed on corn, ground cob and all; of this they had all they could be induced to eat, with access to ripe millet, not threshed, with plenty of water from a stream running through a lot in which they were kept.

After caring for the sick, was requested to inspect the balance of the herd; found four that walked in a peculiarly lame, stiff, and wabbling gait. After a little exercise, walked natural, fed and drank.

April 10th, again visited the herd; two of the four ailing ones at my previous visit were down.

The statement of Mr. Van Benthem was to the effect that two days previous, in turning a short angle, on a smooth dry place in the lot, the red bull broke down, and on the evening of the 9th, the spotted bull was also down, by the side of the stream. They

were brought to the barn and placed in a bed of hay, where I found them in a helpless condition. The spotted one I ordered killed and skinned immediately.

Post mortem.—Large metacarpel, humerus and femur bones, broken obliquely—all on right side; bones healthy, not easily broken with a hammer; an over-abundance of very thick and yellow synovia; no signs of inflammation of the membrane; tendons and lamina normal; inflammation along the pulmonary artery and spine; kidneys healthy; gall bladder distended to its utmost; all the other organs healthy, with the exceptions of the omasum, which was dry and feverish.

This is only the beginning of the end of, as I fear, a loss to Mr. Van Benthem. He is a gentleman from Europe, worth over $80,000, has a large herd of very fine cattle, and many acres of land.

I write hurriedly and I fear imperfectly, so far as a good diagnosis of the case is concerned, but hope you will give it due consideration, and give us a little more light on this important subject. I call the disease inflammatory rheumatism, caused from excessive high feed. I will investigate farther and report if desirable.

A. W. Hoover, V. S.

NECROSIS OF THE TONGUE.

Beaver Dam, March 20, 1883.

Editor Review:

I beg herewith to send you the report of a case which, as far as I could find, has not yet appeared in veterinary literature. It is a total incision and necrosis of the tip of the tongue, caused by too long dentes canini.

On the 20th of December I was called to a patient, which, according to the history of the case, suffered from angina catarrhalis. The principal symptoms were terrible meagerness, normal temperature, pulse and respiration normal, anemia of all mucous membranes, stiffness and œdema on all the legs. Locally, swelling of the parotid and submaxillary glands, efflux of a gluey, slimy, fœtid salivation, bad smell of the mouth. On opening

the cavity with the speculum, one could see that the tip of the tongue was only loosely united with the body, and by the frœnum. It had a dark green-yellowish color, and smelt very badly. On removing the speculum, one could exactly observe, by the movements of the tongue, that the too long dentes canini had caused the incision, and that they fitted exactly in the cleft. How much time it had taken for these teeth to cut the tongue I cannot tell. Naturally, I was obliged to cut the necrotic part away with the bistoury. The stump was treated with a salve of equal parts of turpentine and honey, and healed entirely in six weeks.

COLIC AND HÆMAGLOBIMURIA.

Before I close, I would like to ask you if you ever noticed a case of colic, combined with a kind of "hæmaglobimuria"? Last Friday I was called to a patient who had taken cold during a ride from the country to the city. On the way, he commenced to sweat, to foam and to tremble so awfully, that the possessor was obliged to bring him into the next stable. At my arrival I found the horse still trembling, but no more in an excited condition. Temperature was 37.8° C.; respiration, 42; pulses, 66, soft and large. Intestinal murmurs could not be heard, and naturally I thought to find here the cause of the malady. As defecation had occurred three or four times, and as the patient did not show any distinct or important pains, I thought it the best to bring him home. After a trip of two and a half hours, three miles distance, we safely arrived at home, and after a few minutes the horse urinated a very dark red (black red) urine, just as by hæmaglobimuria. As soon as the horse came into the stable he urinated again as before, and in 15 minutes once again. The urine altogether was over two quarts, of black red color. I now examined the horse again. Temperature, 38.3° C.; pulses, 66; respiration only 18; a proof that there was no congestion toward the lungs. Intestinal murmurs and movement of the bowels were beginning very good; the appetite was also quite good. We covered the horse with several blankets, and gave fluid extract of hyoscyam. and sulphate of sodium. The owner of the horse told me that he had the same malady a year ago, under the same circumstances, but not so severely as this time. Now, the question

which I wish to solve is, How did this congestion of the kidneys occur, so as to produce a kind of hæmoglobimuria? Is it probable that the inactivity of the bowels during the colic was the cause of the bloody urinating? Or have I got to search the cause in a malassimilation of albumen, which by hæmoglobimuria (according to the examinations by Prof. Siedamgrotzky) produces a poison, and the latter causes the congestions of the kidneys and spinal cord? The horse is a very fleshy, heavy, young Norman horse, and has been fed very much upon corn. It is unfortunate that I could obtain no urine to make a microscopic examination. Hoping that you can give me some explanation of this case, I remain,

Yours respectfully,

WILLIAM THIELE, V.S.

POLYPUS OF THE BLADDER.

FORT WALLA WALLA, W. T., April 10, 1883.

Editor Review:

I send you to-day, by express, a tumor of unusual and peculiar growth, that I trust will be interesting in your museum, and otherwise useful.

A condemned cavalry horse, five or six years old, died on March 26th, a short time previous showing slight colicky symptoms, with dripping of urine. On making a post-mortem examination, I found the organs, with exception of kidneys and bladder, in a healthy condition. The latter was very much enlarged and thickened, with appearance of chronic inflammation, and in a state of atony. On opening it, I found this peculiar polypus attached to the neck at the prostates. It is about 12 or 15 inches long, weighed 22 ounces, and is of a cauliflower growth.

The kidneys were pale, soft and enlarged.

It has been in absolute alcohol since March 26th, and, I trust, will reach you in a satisfactory state of preservation.

Wishing anxiously to hear from you on the subject,

I am, with much respect,

R. B. CORCORAN, V.S., 1st U. S. C.

[The specimen has been referred to Dr. Peabody for microscopic examination.—ED.]

NEWS AND SUNDRIES.

CATTLE TRANSPORTATION.—The restrictions upon cattle transportation within the State of New York have been revoked.

EPIZOOTIC ABORTION.—Epizootic abortion has been reported as affecting herds in various localities for some time past.

PATENT MEDICINES.—In Italy, patent medicines are not allowed to be sold, unless the precise composition of the medicine is stated.

DECREE AGAINST AMERICAN PORK.—The intelligence is cabled to this country that Greece has passed a decree prohibiting the importation of American pork.

PASTEUR.—On the reassembling of the French Chambers, the government intend submitting a bill to raise Dr. Pasteur's yearly pension from 12,000 to 25,000 francs.—*Medical Record.*

VETERINARY SURGEONS.—France has one veterinary surgeon for every 1,100 horses, Germany one for every 1,500, and the United States one for each 200,000 domesticated animals.—*Farmers' Review.*

TEXAS FEVER.—Dr. H. J. Detmers, of Champaign, Ill., one of the experts of the Veterinary Division of the Department of Agriculture, has departed for Texas, where he will pursue further inquiries into the subject of Texas fever.

MORE VETERINARIANS NEEDED.—In an address before the Kentucky Medical Society, at its recent session, the practice of veterinary surgery was commended to young men. The speaker estimated that the yearly loss arising from the want of sound advice and treatment—the horses of the country being valued at nearly $800,000,000—amounts to $15,000,000.—*American Cultivator.*

BUFFALO GNATS.—In Arkansas the insect known as the "buffalo gnat" is doing unprecedented damage. The destruction of unprotected horses, mules and cattle is fearful. It is dangerous

to drive stock through the bottom lands of Desha and Chicot Counties, as the gnats are there by millions. In Bolivar County, Miss., nearly 100 mules have been killed by the pests.—*Farmers' Review.*

A NEW HORSE DISEASE.—The Middletown *Mercury*, of Orange County, this State, in its issue of the 27th ult., says: A new disease has made its appearance among the horses in the counties of Franklin and Clinton, and very generally throughout northern New York. It takes the form of rheumatism, usually starting in the fetlocks of the hind legs, frequently extending to all parts of the body. Some cases are resulting in suppuration, which discharges a thin, unhealthy, ichorous pus. Even if the horses recover, they are generally rendered useless by the effect of the disease.—*Turf, Field and Farm.*

PROLIFIC EWES.—The *North British Agriculturist*, Edinburgh, makes mention of some prolific ewes, as follows: "Mr. Adams, Hillhead of Rora, Aberdeenshire, during last week, has had added to his stock of sheep no less than eleven lambs by three ewes, two of the ewes having four each and the other three. The lambs are all living, and appear to be strong and healthy. A ewe belonging to Mr. James Hand, of 'Heugh Farm,' Northumberland, dropped five fine lambs on Saturday. The lambs and mother are all doing well. Mr. Hand has had two or three ewes with four lambs each already this year. On Tuesday, Mr. Thos. Lennox, cattle dealer, Sorbie, had four Yorkshire ewes which dropped no fewer than 13 lambs. Three of them had three lambs each, and one dropped four. All are doing well."—*Nat. Live Stock Journal.*

SYPHILIS IN THE MONKEY.—M. Mortineau reports progress as regards the syphilitic lesions in the monkey inoculated by him. On the fifteenth day mucous patches appeared, and the monkey showed signs of constitutional disturbance. The question whether lower animals can be affected with syphilis, which seems likely to be settled by M. Mortineau, is not one of scientific interest alone. The pathology and treatment of the disease can be greatly helped by a study of it upon such animals.—*Med. Record.*

IMMUNITY OF ANIMALS FROM SYPHILITIC INOCULATION.—Professor Neumann has made a number of attempts to inoculate animals with syphilis, but without success. The experiments were made with the greatest care, the virus being taken directly from the diseased person and introduced into the body of the animal. The animals experimented upon were kept under observation for a considerable period of time after the inoculation. In no case did any results obtain other than those which would naturally follow the introduction of an irritating material into the tissues. Nothing that bore any resemblance to a chancrous tumor was observed. The animals employed in these experiments were three apes, three rabbits, a horse, a hare, a white rat, a marten and a cat. The total number of inoculations was fifty-four. Neumann concludes from these experiments that we must regard syphilis as distinctly a disease of man.—*Med. Central-Zeitung*, January 24, 1883.

THE CULTIVATION OF TUBERCULAR BACILLI.—It is somewhat noteworthy that although a year has passed since Koch announced his discovery of the bacilli of tuberculosis, no one has yet repeated his experiments. The explanation is, no doubt, due to the fact that the experiments are difficult and require a large outlay of time and money, besides much technical skill. We learn now, however, that Professor Feltz, of Nancy, has been attempting to cultivate the bacilli, following strictly Koch's descriptions. He announced recently that all these attempts had proved utter failures, although he exactly followed the directions given him by Dr. Koch for this purpose in his original paper. "In presence of my failures," he says, "I could not be sufficiently thankful if I were furnished with the necessary information to enable me to avoid this kind of misadventure: for I would not cast a doubt, from the facts only which I have just mentioned, upon those which Dr. Koch has so positively affirmed."—*Med. Record.*

AN INSTANTANEOUS LIGHT.—Such in a word is the unique apparatus on exhibition at the rooms of the Portable Electric Light Co., 22 Water Street, Boston. It occupies the space of only five square inches and weighs but five pounds, and can be carried with ease. The light, or more properly lighter, requires no extra

power, wires or connections, and is so constructed that any part can be replaced at small cost. The chemicals are placed in a glass retort; a carbon and zinc apparatus, with a spiral platinum attachment, is then adjusted so as to form a battery, and the light is ready. The pressure on a little knob produces an electric current by which the spiral of platinum is heated to incandescence. The Portable Electric Light Company was recently incorporated, with a capital of $100,000, under the laws of Massachusetts. The usefulness of the apparatus and the low price ($5) will no doubt result in its general adoption. Some of the prominent business men of the State are identified with this enterprise. In addition to its use as a lighter, the apparatus can also be used in connection with a burglar-alarm and galvanic battery.—*Boston Transcript.*

℞ The Parasites in Pork.—From the examination of one thousand hogs in the slaughter-houses of Montreal, Dr. Wm. Osler draws the following conclusions:

1. The investigation shows that the hogs slaughtered for our markets present parasites in numbers sufficient to necessitate a more thorough inspection than is at present carried out.

2. As regards *Trichina Spiralis*, which was found in the proportion of one to 250, we are of opinion that, considering the extreme rarity of cases of trichinosis, and the difficulties attendant upon a systematic inspection, a compulsory microscopic examination of the flesh of every hog killed is not at present called for.

3. In the case of "measles," the liver should be carefully examined, and if present in it, the flesh of the animal should receive the special attention of the inspector; if only in the liver, the entire carcass need not be confiscated.

4. Echinococcus cysts in the liver render that organ unfit for food, but in other parts, unless very numerous and disorganizing, they may be cut out, and the carcass remain marketable.

5. The public should be made aware of the possible dangers of eating, in any form, raw or partially cooked meat. The best safeguard against parasitic affections is not so much inspection of

the flesh, unless, indeed, this is carried out, as careful attention to culinary details.

6. To reduce the number of infested hogs, greater attention should be paid to their hygienic surroundings, particularly in the matter of feeding. The danger is not during the period when the animals are penned and fed on grain, etc., but when they are allowed to roam at large and feed indiscriminately.— *Western Medical Reporter.*

EXCHANGES, ETC., RECEIVED.

FOREIGN.—Presse Veterinaire, Revue Scientifique, Gazette Medicale, Revue Dosimetrique, Annales de Bruxelles, Revue d'Hygiene, Journal de Zoötechnie, Archives Veterinaires, Recueil de Medecine Veterinaire, Clinica Veterinaria, Veterinarian, Veterinary Journal, Revue fur Thierheilkunde und Thierzucht, Schweizerisches Archiv fur Thierheilkunde und Thierzucht.

HOME.—Druggists' Circular, Prairie Farmer, Rural New Yorker, National Live Stock Journal, Breeders' Gazette, Country Gentleman, American Agriculturist, Spirit of the Times, Turf, Field and Farm, Medical Record.

JOURNALS.—New England Homestead, Nebraska Farmer, College Clinical Record, Medical Herald, Cultivator, Farmers' Review.

PAMPHLETS.—Etat Sanitaire des Animaux Domestiques en Belgique, On Demodux Phylloides in the Skin of Canadian Swine.

COMMUNICATIONS.—W. Devoe, A. A. Holcombe, John Faust, J. B. Cosgrove, C. B. Michener, F. S. Billings, N. Lanzilloti Buonsanti, A. A. Hoskins.